Epitomes

Important Advances in Clinical Medicine

Physical Medicine and Rehabilitation

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The Council on Scientific Affairs of the California Medical Association presents the following epitomes of progress in physical medicine and rehabilitation. Each item, in the judgment of a panel of knowledgeable physicians, has recently become reasonably firmly established, both as to scientific fact and clinical importance. The items are presented in simple epitome, and an authoritative reference, both to the item itself and to the subject as a whole, is generally given for those who may be unfamiliar with a particular item. The purpose is to assist busy practitioners, students, researchers, and scholars to stay abreast of progress in medicine, whether in their own field of special interest or another.

The epitomes included here were selected by the Advisory Panel to the Section on Physical Medicine and Rehabilitation of the California Medical Association, and the summaries were prepared under the direction of Murray E. Brandstater, MD, and the panel.

Osteoporosis in Men With Spinal Cord Injuries

THE DEVELOPMENT OF osteoporosis in men with spinal cord injuries has not been systematically studied. In the general population, bone mass declines with age. Factors associated with aging account for the slow phase of bone loss, which begins in the cortical bone by age 40 and continues at a rate of 0.6% annually. In trabecular bone the process may begin earlier and continues at a rate of 0.7% per year. It is well known that spinal cord injury is accompanied by bone mass loss due to accelerated bone remodeling with bone resorption exceeding bone formation.

Senile bone loss (type II osteoporosis) is largely due to decreased intestinal calcium absorption, with compensatory secondary hyperparathyroidism resulting in increased bone resorption. A study of bone turnover in older bedridden patients showed that the increased bone resorption is not due to "type II" secondary hyperparathyroidism; rather, the bone resorption is primarily increased. For this reason, we would expect a pronounced pattern of osteoporosis in older patients with spinal cord injury that differs from senile (type II) osteoporosis. The lack of load bearing on the bone with increased bone resorption could be postulated as a primary factor.

In a recent study of men 1 to 59 years after spinal cord injuries, the demineralization pattern revealed no evidence of osteoporosis in the spine at any time. The hips, however, had osteoporosis to the fracture threshold at one to nine years after injury. Hip bone mass continued to decline with age, but the spine bone mass continued to rise. Dual-energy x-ray absorptiometry (DEXA) measurements were correlated with hip and spine x-ray films. Although the spine films showed an accelerated development of osteoarthritis, there was no evidence of degenerative arthritis in the hips of men with spinal cord injuries. The spine bone mass remained at 120% to 130% compared with controls. The lowest detected bone mass at the hips was 65% of that in controls (3 standard deviations below fracture threshold) at 30 to 39 years after injury. After the lowest decline, the hip bone mass began rising past the fracture threshold by 40 to 49 years after injury.

There were no further changes detectable with DEXA later on in hip or spine bone mass of patients with spinal cord injuries. The study evaluated patients as long as 50 to 59 years after injury.

It is not surprising that three quarters of these men have hip fractures during routine activities. There is no standard treatment regimen for fracture management in these patients. Some patients undergo operative procedures. Most are left to heal with bulky callus that predisposes them to pressure sores caused by poor sitting positions.

Preventive intervention should begin one year post-injury. If bone densitometry studies reveal osteoporosis of the appendicular skeleton at a significant degree (two standard deviations below normal), treatment may be initiated earlier then one year after injury. The recommended dose is 10 mg daily prior to the first meal. The length of treatment should be based on DEXA measurements obtained at six-month intervals.

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